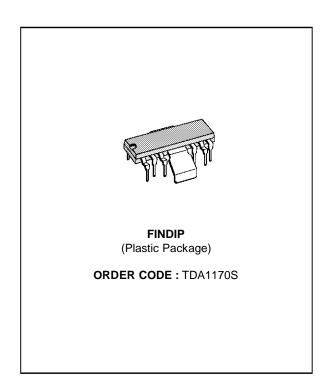


TDA1170S

TV VERTICAL DEFLECTION

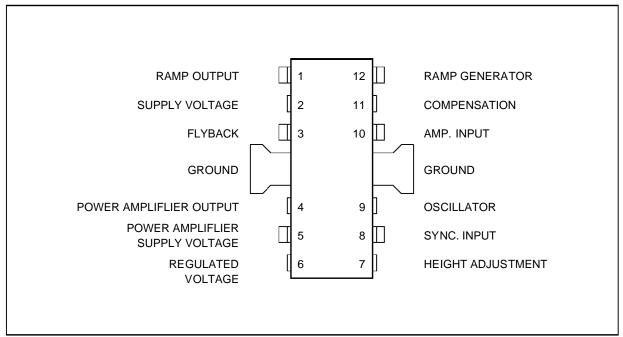
- SYNCHRONIZATION CIRCUIT
- OSCILLATOR AND RAMP GENERATOR
- HIGH POWER GAIN AMPLIFIER
- FLYBACK GENERATOR
- VOLTAGE REGULATOR



DESCRIPTION

The TDA1170S is a monolithic integrated circuit in a 12-lead quad in-line plastic package. It is intended for use in black and white and colour TV receivers.

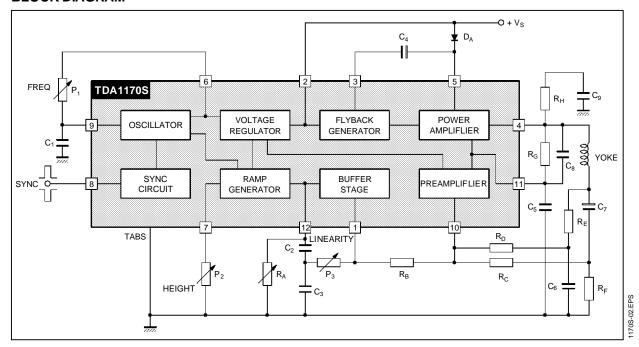
PIN CONNECTIONS



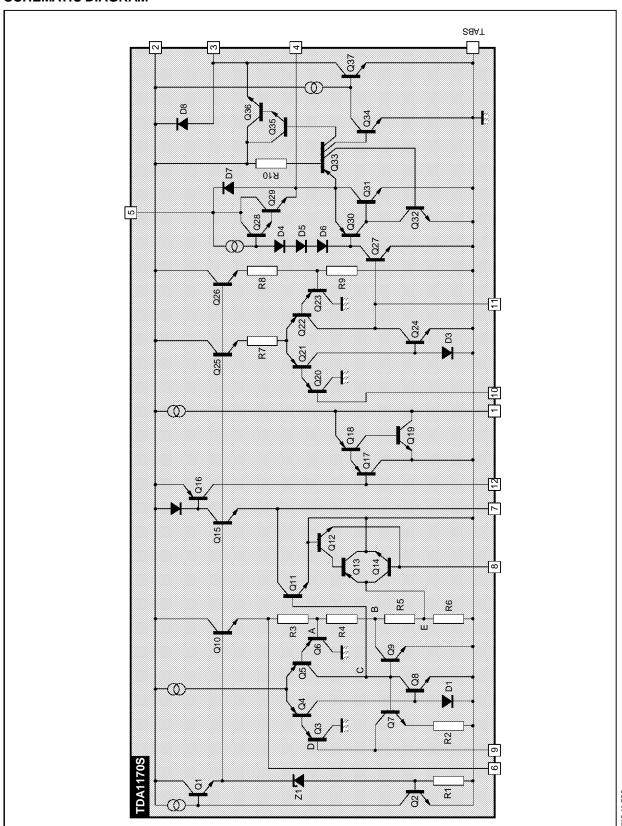
170S-01.EPS

December 1992 1/9

BLOCK DIAGRAM



SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vs	Supply Voltage at Pin 2	35	V
V ₄ , V ₅	Flyback Peak Voltage	60	V
V ₁₀	Power Amplifier Input Voltage	+ 10 - 0.5	V
lo	Output Peak Current (non repetitive) at t = 2msec	2	Α
lo	Output Peak Current at f = 50Hz t ≤ 10µsec	2.5	Α
lo	Output Peak Current at f = 50Hz t > 10μsec	1.5	Α
l ₃	Pin 3 DC Current at V ₄ 2	100	mA
l ₃	Pin 3 Peak to Peak Flyback Current for f = 50Hz, t _{fly} ≤ 1.5msec	1.8	Α
l ₈	Pin 8 Current	± 20	mA
P _{tot}	Power Dissipation : at T _{tab} = 90 °C at T _{amb} = 80 ° C	5 1	W W
T _{stg} , T _j	Storage and Junction Temperature	- 40, + 150	°C

THERMAL DATA

Symbol	Parameter	Value	Unit] #
R _{th j-tab}	Thermal Resistance Junction–tab Max	12	°C/W	3-02.
R _{th j-amb}	Thermal Resistance Junction-ambient Max	70	°C/W	1170

^(°) Obtained with tabs soldered to printed circuit with minimized copper area.

ELECTRICAL CHARACTERISTICS

(refer to the test circuits, V_S = 35V, T_{amb} = 25°C, unless otherwise specified) DC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit	Fig.
l ₂	Pin 2 Quiescent Current	$I_3 = 0$		7	14	mA	1b
l ₅	Pin 5 Quiescent Current	$I_4 = 0$		8	15	mA	1b
- I 9	Oscillator Bias Current	V ₉ = 1V		0.1	1	μА	1a
- I ₁₀	Amplifier Input Bias Current	$V_{10} = 1V$		0.1	1	μΑ	1b
- I ₁₂	Ramp Generator Bias Current	$V_{12} = 0$		0.02	0.3	μΑ	1a
- I ₁₂	Ramp Generator Current	$I_7 = 20 \mu\text{A}, V_{12} = 0$	19	20	24	μΑ	1b
$\frac{\Delta I_{12}}{I_{12}}$	Ramp Generator Non-linearity	$\Delta V_{12} = 0$ to 12V, $I_7 = 20\mu A$		0.2	1	%	1b
Vs	Supply Voltage Range		10		35	V	_
V ₁	Pin 1 Saturation Voltage to Ground	I ₁ = 1 mA		1	1.4	V	_
V ₃	Pin 3 Saturation Voltage to Ground	I ₃ = 10 mA		1.7	2.6	V	1a
V ₄	Quiescent Output Voltage	$V_S = 10V$ R1 = $10k\Omega$, R2 = $10k\Omega$	4.1	4.4	4.75	V	1a
		$V_S = 35V$ R1 = 30k Ω , R2 = 10k Ω	8.3	8.8	9.45	V	1a
V ₄ L	Output Saturation Voltage to Ground	$-I_4 = 0.1A$ $-I_4 = 0.8A$		0.9 1.9	1.2 2.3	V	1c 1c
V _{4H}	Output Saturation Voltage to Supply	$I_4 = 0.1A$ $I_4 = 0.8A$		1.4 2.8	2.1 3.2	V	1d 1d
V ₆	Regulated Voltage at Pin 6		6.1	6.5	6.9	V	1b
V ₇	Regulated Voltage at Pin 7	Ι ₇ = 20μΑ	6.2	6.6	7	V	1b
$\frac{\Delta V_6}{\Delta V_S}$, $\frac{\Delta V_7}{\Delta V_S}$	Regulated Voltage Drift with Supply Voltage	$\Delta V_S = 10 \text{ to } 35 \text{V}$		1		mV/V	1b
V ₁₀	Amplifier Input Reference Voltage		2.07	2.2	2.3	V	_
R8	Pin 8 Input Resistance	V ₈ ≤ 0.4V	1			МΩ	1a

'0S-03.TBL

Figure 1 : DC Test Circuit

Figure 1a

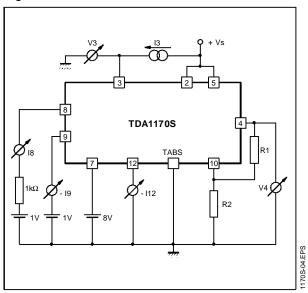


Figure 1b

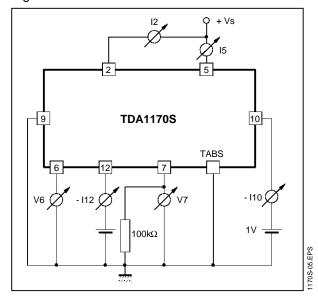


Figure 1c

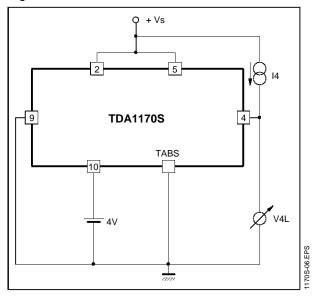
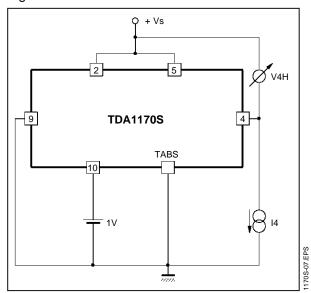


Figure 1d

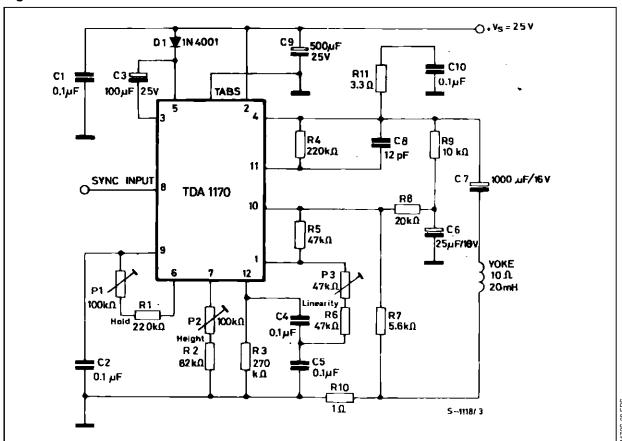


ELECTRICAL CHARACTERISTICS

(refer to the test circuit, $V_S = 25V$; f = 50Hz; $T_{amb} = 25^{\circ}C$, unless otherwise specified) AC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
Is	Supply Current	$I_y = 1App$		140		mA
l ₈	Sync. Input Current (positive or negative)		500			μΑ
V_4	Flyback Voltage	$I_y = 1App$		51		V
V ₉	Peak to Peak Oscillator Sawtooth Voltage			2.4		V
t _{fly}	Flyback Time	$I_y = 1App$		0.7		ms
fo	Free Running Frequency	$(P_1 + R_1) = 300k\Omega$, $C2 = 0.1 \mu F$ $(P_1 + R_1) = 260k\Omega$, $C2 = 0.1 \mu F$		42.2 48.5		Hz Hz
Δf	Synchronization Range	I ₈ = 0.5mA	14			Hz
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	V _S = 10 to 35V		0.005		Hz/V
$\frac{\Delta f}{\Delta T_{tab}}$	Frequency Drift with Tab Temperature	T _{tab} = 40 to 120°C		0.01		Hz/°C

Figure 2 : AC Test Circuit



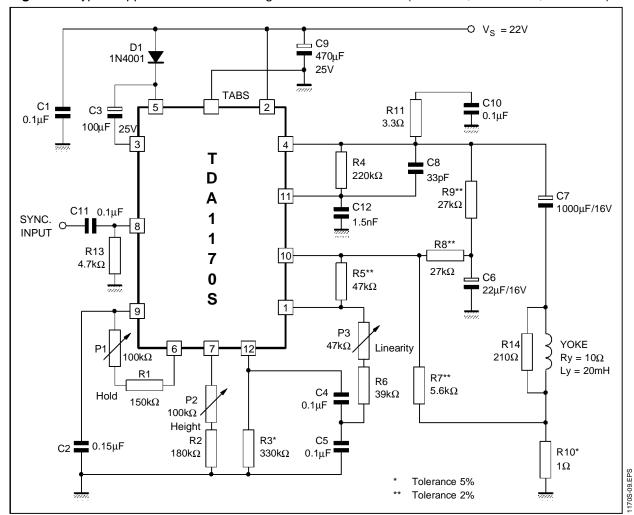


Figure 3 : Typical Application Circuit for Large Screen B/W TV SET (RY = 10Ω , LY = 20mH, IY = 1APP)

TYPICAL PERFORMANCE

Symbol	Parameter	Value	Unit
Vs	Operating Supply Voltage	22	V
Is	Supply Current	145	mA
t_{fly}	Flyback Time	0.7	ms
P _{tot}	Power Dissipation	2.3	W
ly	Maximum Scanning Current (peak to peak)	1.2	Α

For safe working up to $T_{amb} = 60^{\circ}C$ a heatsink of $R_{th} = 14^{\circ}C/W$ is required.

1170S-05.TBL

MOUNTING INSTRUCTION

The junction to ambient thermal resistance of the TDA 1170S can be reduced by soldering the tabs to a suitable copper area of the printed circuit board (fig. 4) or to an external heatsink (fig. 5).

Figure 4: Example of P.C Board Copper Are is Used as Heatsink

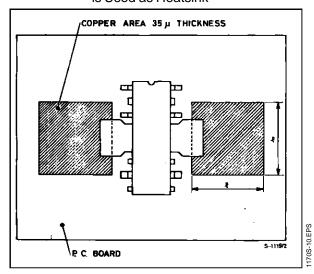
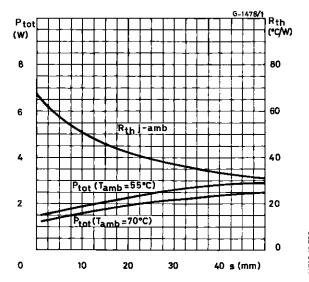


Figure 6 : Maximum Power Dissipation and Junction-Ambient Thermal Resistance versus "S"



The diagram of fig. 6 shows the maximum dissipable power P_{tot} and the $R_{th\ j\text{-amb}}$ as a function of the side "s" of two equal square copper areas having a thickness of 35 μ (1.4 mil).

Figure 5: Example with External Heatsink

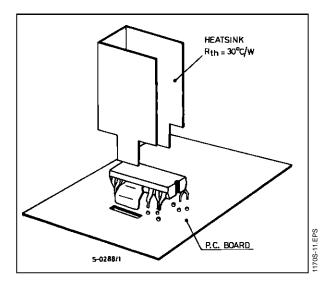
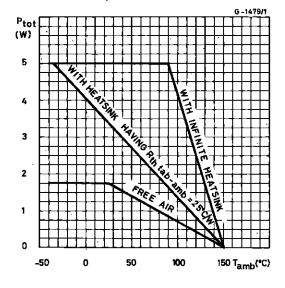
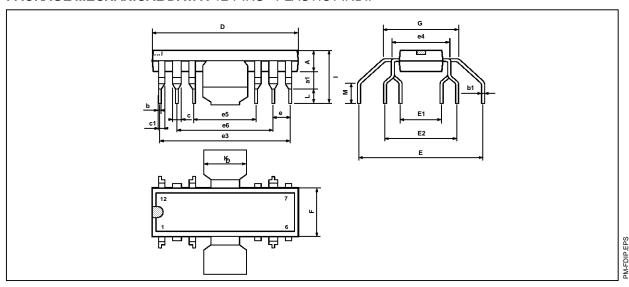


Figure 7: Maximum Allowable Power Dissipation versus Ambient Temperature



70S-13.EP

PACKAGE MECHANICAL DATA: 12 PINS - PLASTIC FINDIP



Dimensions		Millimeters			Inches	
Dimensions	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	3.8		4.05	0.150		0.159
a1	1.5		1.75	0.059		0.069
b	0.55		0.6	0.022		0.024
b1	0.3		0.35	0.012		0.014
С		1.32			0.052	
c1		0.94			0.037	
D	19.2		19.9	0.756		0.783
Е	16.8	17.2	17.6	0.661	0.677	0.693
E1	4.86		5.56	0.191		0.219
E2	10.11		10.81	0.398		0.426
е	2.29	2.54	2.79	0.090	0.100	0.110
e3	17.43	17.78	18.13	0.686	0.700	0.714
e4		7.62			0.300	
e5	7.27	7.62	7.97	0.286	0.300	0.314
e6	12.35	12.7	13.05	0.486	0.500	0.514
F	6.3		7.1	0.248		0.280
G		9.8			0.386	
I	7.8		8.6	0.307		0.339
K	6.1		6.5	0.240		0.256
L	2.5		2.9	0.098		0.114
M	2.5		3.1	0.098		

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No licence is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I^2C Components of SGS-THOMSON Microelectronics, conveys a license under the Philips I^2C Patent. Rights to use these components in a I^2C system, is granted provided that the system conforms to the I^2C Standard Specifications as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

